

The 835A is a complete UHF Solid State Internally Diplexed Television Transmitter which operates at a nominal Visual Output Power for a 4 kW of 4000 Watts Peak of Sync and Average Aural Output Power of 400 Watts, at an A/V Ratio of 10 dB, 10 % Sound or 200 Watts at 13 dB, 5 % Sound, or for a 5 kW, 5000 Watts Peak of Sync and Average Aural Output Power of 500 Watts, at an A/V Ratio of 10 dB, 10 % Sound or 250 Watts at 13 dB, 5 % Sound, or for a 6 kW, 6000 Watts Peak of Sync and Average Aural Output Power of 600 Watts, at an A/V Ratio of 10 dB, 10 % Sound or 300 Watts at 13 dB, 5 % Sound. The 835A is made up of three Cabinets, a UHF Single Exciter Cabinet and two Amplifier Array Cabinets.

The standard 835A is functionally comprised of (A1) a Single UHF Exciter Assembly, (A2 & A3) two Amplifier Array Assemblies, (A4) a Hybrid Combiner Assembly, (A9) a Bandpass Filter, (A10) an Output Trap Filter Assembly and (A11) an Output Coupler Assembly. A sample is taken from the Hybrid Combiner and connected to (A7) a Directional Coupler.

The (A1) Single UHF Exciter Assembly contains (A1) a UHF Exciter Tray, (A3) a Splitter, (A4 & A5) two Variable Phase/Gain Trays (1245-1200), (A6) a Metering Panel, (A8) an AC Distribution Assembly, Exciter (1245-1500) and (A9) a Remote Interface Assembly (1245-1801). This Exciter also contains a UHF Receiver Tray (1265-1100).

The (A2 & A3) 2-3 kW Amplifier Array Assemblies (1278-1300) each contain (A9-A1) an 8 Way Splitter (ZFSC-8-43), in a 4 kW four (A1, A2, A3 & A4), in a 5 kW five (A1, A2, A3 A4 & A5) and in a 6 kW six (A1, A2, A3 A4, A5 & A6) UHF Amplifier Trays, (A7) a 4, 5 or 6 Way Combiner, (A8) an Output Coupler, (A10) an AC Distribution Assembly for 3 Phase (1278-1100) or for Single Phase (1278-1200) and (A11) an Interface Panel. The reject output from the Combiner Board connects to (A12-A2) the Combiner Reject Load Board.

(A1) Single UHF Exciter Assembly

The Single UHF Exciter Assembly contains (A1) a UHF Exciter Tray (1245-1100) which operates using either the IF Output from the (A7) UHF Receiver Tray connected to J1 on the ALC Board (1265-1305) or the Combined IF Output generated from the Baseband Audio and Video Inputs connected to J32 on the ALC Board. The two IF Outputs are connected to the IF Relays K3 and K4, located on the ALC Board and by applying or removing a Jumper on Jack J8 Pins 10 & 11 located on (A9) the Remote Interface Assembly (1245-1801) the IF Output is selected. To select the output from the Modulator, J8-10 and 11, must be connected together. To select the output from the Receiver Tray, J8-10 and 11, must not be connected together.

The UHF Receiver Tray (1265-1100) takes the received RF On Channel Frequency and generates a 45.75 MHz + 41.25 MHz Combined IF Output. The Combined IF Output of the Receiver Tray connects to J6 on the rear of the (A1) UHF Exciter which is wired to J1 on the ALC Board. With Receiver selected, no connection between J8-10 and 11 on the Remote Interface Assembly, the IF Output from the Receiver Tray connects through the Relays to the rest of the ALC Board.

The Baseband Audio, from TB1 or J3, and Video, from J1, connect to the UHF Exciter which produces a Combined IF Output that connects to J32 on the ALC Board. To select the output from the Modulator, J8-10 and 11, must be connected together. The Exciter RF Output of the (A1) UHF Exciter at J15 is connected to the S Input on (A3) the Splitter.

The Output of the UHF Exciter is split two ways by A3 with the RF Output #1 connected to the input of the (A5) Variable Phase/Gain Tray (1245-1200) and the RF Output #2 connected to the input of the (A4) Variable Phase/Gain Tray (1245-1200).

The output of the (A4) Variable Phase/Gain Tray connects to (A2) the Side A 2-3 kW Amplifier Array Assembly (1278-1300). The output of the (A5) Variable Phase/Gain Tray connects to (A3) the Side B 2-3 kW Amplifier Array Assembly (1278-1300).

(A2 & A3) 2-3 kW Amplifier Array Assemblies (1278-1300)

The (A2 & A3) Amplifier Array Assemblies are identical, with each Assembly containing (A9-A1) an 8 Way Splitter (ZFSC-8-43), four for 4 kW (A1, A2, A3 & A4), five for 5 kW (A1, A2, A3, A4 & A5) or six for 6 kW (A1, A2, A3, A4, A5 & A6) UHF Amplifier Trays, (A7) a 4, 5 or 6 Way Combiner, (A8) an Output Coupler (1016-1043) and (A10) an AC Distribution Assembly for 3 Phase (1278-1100) or for Single Phase (1278-1200). The reject output from the 4, 5 or 6 Way Combiner Board connects to (A12-A2) the Combiner Reject Load Board (1278-1311).

(A2 & A3) 2-3 kW Amplifier Assemblies (1278-1300) - Continued

The RF Input from the Variable Phase/Gain Tray connects to J1 on (A11) the Interface Panel located in the Amplifier Array Assembly. The RF is connected to the COM Input of (A9-A1) the 8 Way Splitter which splits it eight ways. The outputs connected to J1, the RF Input Jack on each of the UHF Amplifier Trays or are terminated with 50Ω. Each of the UHF Amplifier Trays amplify the RF signals to the power needed to produce a the total output power for the Transmitter , with a maximum of 600 Watts per Tray. The outputs of the UHF Amplifier Trays are combined in (A7) the 4, 5 or 6 Way Combiner that provides approximately half of the power needed to generate the desired Peak of Sync Output with a maximum of 3000 Watts per Array Assembly. The Combined RF Output is connected to (A8) the Output Coupler Assembly which supplies a Forward and a Reflected Power Sample of the output from the Amplifier Assembly to the Metering Panel in the Single Exciter Assembly. The reject output of the Combiner connects to (A12-A2) the Combiner Reject Load Board which dissipates any reject due to miss-tuning or a malfunction in any of the Amplifier Trays.

In each UHF Amplifier Tray, a Forward Power Sample and a Reflected Power Sample, from the Combiner Board, are connected to the Dual Peak Detector Board, Single Supply which provides peak detected forward samples to the Amplifier Control Board that supplies the samples to the front panel meter of the UHF Amplifier Tray. Before exiting each UHF Amplifier Tray the RF is fed through a Circulator for protection of the Tray from high VSWR conditions. The Reject Port of the Circulator provides a Reject Sample to the Combiner Board which supplies the Reflected Sample to the Dual Peak Detector Board, Single Supply located in the Tray that connects to the front panel meter for monitoring purposes.

Transmitter Output Assemblies

The outputs of the (A2 & A3) Amplifier Assemblies connect through (A5 or A6) 1-5/8" to 3-1/8" Adapters to (A4) a Hybrid Combiner which combines the output from each Amplifier Assembly into a single output. The Reject Output of the Hybrid Combiner is connected through (A12) a 1-5/8" to 3-1/8" Adapter to (A7) a Directional Coupler (1016-1043) which provides a Reject Sample from J3 to the Metering Panel located in the Single UHF Exciter Assembly for monitoring purposes. The output of the Directional Coupler connects to (A8) a 2500 Watt Reject Load which dissipates any reject due to problems in one of the Amplifier Arrays. Mounted on the 2500 Watt Load is (A8-A1) a Thermal Switch that connects to the Overtemperature Fault circuit located on the Transmitter Control Board in the UHF Exciter Tray. If the temperature of the load reaches 155°F. the switch closes and causes an Overtemperature Fault to occur which shuts down the Tray.

The output of the Hybrid Combiner at J3 is fed to (A9) a Bandpass Filter, (A10) an Output Trap Filter Assembly, then to (A11) the Output Coupler Assembly and finally to the Antenna for your System. The Bandpass Filter and Trap Filter are tuned to provide high out of band rejection of unwanted generated products. The filtered signal is connected to (A11) an Output Coupler Assembly which provides a Combined Forward and a Combined Reflected Power Sample to the Metering Panel located in the Single UHF Exciter Assembly. The Forward Sample is processed to provide peak detected Visual and Aural Power Output Samples to the front panel Meter of the Metering Panel. The Reflected Power Sample is also peak detected and wired to the front panel Meter. A Sample of the RF Output, for test purposes can be taken from J5 on the Coupler, but a 20 dB Attenuator must be connected to J6 for the Sample port to operate. An appropriate attenuator must be connected to J5 to protect any test equipment connected to it.

Control and Status

The Control and Status of the Transmitter are provided by the Meter indications on the Metering Control Panel and the Variable Phase/Gain Trays. There are also Control, Status and LED Indications located on the front panel of the UHF Exciter Tray.

The switches and LED indicators, which are mounted so that the switches and LEDs are operated or viewed from the front Panel of the UHF Exciter, are part of the Transmitter Control Board (1265-1311). On the UHF Exciter Tray, switch (S1) is an Operate/Standby Switch that provides the Operate Command (Enable), when in Operate, to the each of the Amplifier Arrays.

The Enable to each Amplifier Array Assembly at J4-15 & 16 is split ways on the terminal block A9-TB2 which are then applied to each of the UHF Amplifier Trays. The Enable is needed to turn on the Switching Power Supplies located in each of

the UHF Amplifier Trays.

Control and Status - Continued

When the UHF Exciter is in Operate, the Green LED (DS2) is On and when in Standby the Amber LED (DS1) is On. **Note:** If the Transmitter does not switch to Operate when S1 is switched to Operate, check that a dummy plug, with a Jumper between Pins 1 & 2, is connected to Jack J7 located on (A9) the Remote Interface Assembly in the Single UHF Exciter Assembly. This Jumper provides the Interlock needed for the operation of the Transmitter. If the Interlock is present, the Green LED (DS5), located on the Transmitter Control Board, should be lit.

Operation of the Transmitter is controlled by the front panel switches located on the UHF Exciter Tray. During Normal operation of the Transmitter, Switch S2 should be in the Auto position. The front panel of the UHF Exciter also has LEDs that indicate a Video Fault (Loss), Red LED (DS9) and a VSWR Cutback, Amber LED (DS7).

Baseband Input and Remote Connections

The Baseband Video and Audio Inputs to the Transmitter, connect to the (A9) Remote Interface Panel located on the rear of the Single UHF Exciter Assembly. The Baseband Video Input connects to Jack J2, which is loop-thru connected to J1, that is wired to J1 on the Exciter. The Baseband Audio Input connects to Terminal Block TB1 for Balanced Audio or to Jack J6, which is loop-thru connected to J13, that is wired to J3 on the Exciter, for Composite, Stereo, Audio.

Remote Monitoring and Operation of the Transmitter is provided through the Jacks (J8, J9 & J10) located on (A9) the Remote Interface Assembly located on the rear of the Single UHF Exciter Assembly. Jack (J7) should have a dummy plug connected to it, which has a jumper connected between Pins 1 & 2, that provides the Interlock to the Exciter needed to operate the Transmitter. If the Jumper is missing, the Transmitter will not switch to Operate. If remote connections are made to the Transmitter they should be made through the plugs provided in the Installation Material as noted on the Interconnect Drawing (1278-8400) for the Single UHF Exciter. The On Channel RF Input to the Receiver Tray connects to the Transmitter through (A9) the Remote Interface Assembly at J1, "N" type connector, for 50Ω Input or J3, "F" type connector, for 75Ω Input.

Main AC Input

The Transmitter needs an AC input of 208/240 VAC 55 Amps for 3 Phase or 100 Amps for Single Phase for each Amplifier Assembly and 20 Amps Single Phase for the Single Exciter Assembly.

The 208/240 VAC Input to each Amplifier Assembly connects to (A10) the AC Distribution Assembly located on the right side, center rear of the Cabinet. The Assembly contains the Terminal Block (TB1) to which the 208/240 Three Phase or Single Phase connects. For 3 Phase: Line 1 to TB1-1A, Line 2 to TB1-2A, Line 3 to TB1-3A and Safety Ground to TB1-4A. For Single Phase: Line 1 to TB1-1A, Line 2 to TB1-3A and Safety Ground to TB1-4A. The AC Distribution Panel contains six Circuit Breakers that supply the AC to the rest of the Amplifier Assembly. The Input AC from TB1B is connected to (CB1) the Main AC Circuit Breaker (55 Amps for 3 Phase or 100 Amps for Single Phase) which distributes the 208/240 VAC to the other circuit breakers. The output of CB1 has six MOVs, VR1, VR2, VR3, VR4, VR5 and VR6 mounted to it. VR4, VR5, and VR6 are connected from the AC Lines to Ground and VR1, VR2, and VR3 are connected across the AC Lines. The switched Input AC is wired through the five Circuit Breakers, CB2-CB6, via AC Line Cords to the five UHF Amplifier Trays mounted in each Amplifier Array Cabinet. CB2 is a 20 Amp Circuit Breaker which supplies the AC voltage to the (A1) UHF Amplifier Tray. CB3 is a 20 Amp Circuit Breaker which supplies the AC voltage to the (A2) UHF Amplifier Tray. CB4 is a 20 Amp Circuit Breaker which supplies the AC voltage to the (A3) UHF Amplifier Tray. CB5 is a 20 Amp Circuit Breaker which supplies the AC voltage to the (A4) UHF Amplifier Tray. CB6 is a 20 Amp Circuit Breaker which supplies the AC voltage to the (A5) UHF Amplifier Tray. CB7 is used in the 6 kW Transmitter and supplies AC to the (A6) UHF Amplifier Tray. The circuit breakers CB8 and CB9 are not used in the 2 kW Amplifier Array Assemblies. These circuit breakers control the AC to the A12-A3 and A12-A5 Fans mounted on the (Optional) (A12) Reject Load Assembly which are part of the 2.5 and 3 kW Amplifier Array Assemblies.

Main AC Input - Continued

The 208/240 VAC Input to the UHF Exciter Assembly connects to (A8) the AC Distribution Assembly, UHF Exciter Assembly (1245-1500) located in the right, center rear of the Cabinet. The Assembly contains the Terminal Block (TB1) to which the 208/240 VAC connects. Line 1 to TB1-1, Line 2 to TB1-3 and Safety Ground to TB1-2. The AC Distribution Assembly contains (CB1) the Main Circuit Breaker (20 Amps) that supplies the AC to the rest of the Single Exciter Assembly. The output of CB1 has three MOVs, VR1, VR2 and VR3, connected to it, one connected from each Line of the Input AC to ground and one across the two lines. The AC output of CB1 is wired to A1 and A2 which are IEC Outlet Strips. The (A1) Exciter and the (A4) Variable Phase/Gain Tray plug into the (A1) IEC Outlet Strip. The (A5) Variable Phase/Gain Tray, the (A6) Metering Panel and the (Optional) (A7) Receiver Tray plug into the (A2) IEC Outlet Strip.

When the Circuit Breaker CB1 on the Single UHF Exciter Assembly is switched On, +12 VDC from the Exciter is supplied to each of the Amplifier Array Cabinets. The +12 VDC is split 5 Ways on the terminal block A9-TB1 and connected to each of the UHF Amplifier Trays. The +12 VDC is used for operation of the LED Status Indicators in the UHF Amplifier Tray.

Instruction Manual Description

The Instruction Manual is divided into sections which are labeled as to their contents. The first main section is the System Section which contains the Parameters and Specifications of the 835A along with the Site Preparation, Installation, Initial Turn On, System Set Up, Alignment and Operation Procedures. The Block Diagram and Interconnect Drawings for the Transmitter are also found in the System Section.

The Manual is further divided into Tray and Assembly Sections. Each Tray or Assembly Section of the Manual contains the Block Diagrams and Interconnects of that Assembly or Tray. Each of the Sections also contains the Circuit Descriptions and Detailed Alignment Procedures for that Tray or Assembly.

The Schematics for the individual boards which make up the Trays and Assemblies in the Transmitter are located in the Subassembly Section of the Manual. There is a Drawing List at the beginning of the Subassembly Section which lists the drawings in the order they appear in the section.